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OPTIMUS RAD–R/F release 3.7

Upgrade kit release ≥ 3.3 >> 3.7

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Level 0 Documentation

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SERVICE MANUAL − UNIT

OPTIMUS RAD − R/F release 3.7
Upgrade kit release ≥ 3.3 >> 3.7

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Upgrade kit OPTIMUS RAD – R/F release 3.7

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1. INTRODUCTION

This modification kits provides the latest software for OPTIMUS rel. 3.x generators.

Together with the user desk and the high-speed rotor control software it delivers all current improvements and bug fixes for the OPTIMUS generators.

2. COMPATIBILITY

For all OPTIMUS RAD / RF release 3.x generators carefully observe all prerequisites specified in chapter 4.

3. EXPLANATION OF CHANGES FOR THE CUSTOMER / APPLICATION

The maximum value for dose correction has been limited.

At Bucky auxiliaries the sum of all dose corrections is

max. +/− 2 steps of 25% (+/− 4 formerly)

or

+/− 4 steps of 12% (+/− 8 formerly)

or

+/− 8 steps of 6% (+/− 16 formerly).

This is valid for all auxiliary settings, individual APR settings and patient size corrections.

At DSI auxiliaries no dose corrections are possible anymore except for the patient size corrections (same max. limits as for Bucky). One should be aware of the fact that the image quality might change with additional dose corrections.

This requires that the APR is downloaded to have the data available for maintenance in case there are higher correction values programmed than possible after the upgrade.

Higher correction values are automatically limited after the flash load process.

- Use the program APRMAN.EXE (version 2.1 13.3.1999) to download all APR from the generator and save them as a file.

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4. PREREQUISITES

- PMSSEC

The following FCOs must have been carried out:

- 00 135 004 Error combination 00XI + 00M3
- 00 135 006 Upgrade to release 3.3
- 00 135 009 Electric shock during service activities (50kW only)
- 00 135 014 Firmware update kV-control (65/80kW only) to release 3.2 RAD and release 1.2 R/F
- 00 135 016 Error 00TH during tube adaptation

5. CONTENTS OF UPGRADE

- OPTIMUS / Tool CD 4512 116 0680x
- Uk OPTIMUS RAD−R/F rel. 3.7 / Doku CD 4512 977 0015x
- PROM C300 D2 control desk 4512 113 20525
- PROM Y100 rotor control high-speed 4512 113 22323
  (only for rotor control units 4512 104 7142**.** and 4512 104 7146**.**, check 12NC at unit base plate).
- This document 4512 988 02471
- User manuals OPTIMUS 50/65/80 release 3.x
  (English, French, German, Spanish)

6. MODIFICATION

6.1. PROM EXCHANGE

- Switch OFF the generator.
- Open the control desk. If PROM D2 is labeled **... 20531** or higher do not replace **PROM D2.**
  If PROM D2 labeled ≤ **20524** on C300 exchange PROM D2 with **20525**.

If units 4512 104 7142**.** or 4512 104 7146**.** are present:

- Exchange the rotor control PROM labeled **4512 113 22323**.

If units 4512 104 7361**.** are present:

- Do not exchange the rotor control PROM labeled **4512 113 22323**.
- Switch ON the generator.
- Check with the new PROMs that the system behaves as it did before:
  - control desk display and usage.
  - acceleration and braking if the RoCo PROM was exchanged.

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6.2. ESTABLISH PC-GENERATOR CONNECTION

- Establish connection with the data cable between PC and generator. Start AGenT with PC-hardkey and by clicking on the respective icon. If not already started, PMSSEC is started automatically nowt.

The actual exposure counter table must be recorded. These tables get lost after flash loading of release 3.7. They are replaced by the improved counter table of release 3.7.

AGenT / Acceptance / Inspect / Tube 1 ... 3 / Type and Statistic of Tube 1 ... 3

- Enter the counter table(s) in the system log book.
- Keep the PC / generator data connection established and the AGenT program running at the PC, switch the generator OFF.

6.3. PREPARATION OF THE GENERATOR

6.3.1. Preparation of generators without a CAN interface

- Switch ON the generator.
  The loading process can be started once relay ENK1 has been energized.

6.3.2. Preparation of the generator

Preparation of generators without a CAN interface:

- Switch ON the generator.
  The loading process can be started once relay ENK1 has been energized.

Preparation of generators which are connected via a CAN interface:

– BuckyDiagnost TH and TH2
– DigitalDiagnost
– Thoravision

- Switch OFF the generator.
- Disconnect the following plugs:

System	Connector		
	EZX23 signal bus	EZX42 or EZX42−1 system CAN	EZX43 or EZX43−1 system CAN
BuckyDiagnost TH / TH2	X		X
DigitalDiagnost	X	X	X
Thoravision	X	X	X

- Switch ON the generator.

NOTE

The download procedure must not be started before relay ENK1 has been energized at least 2 minutes after the generator has been switched ON.

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6.4. CU BACKUP

CAUTION

Connection between service PC and generator must be established.
For the backup of data the service PC must be operated on mains. It must not be operated with batteries.
The screensaver must be deactivated.

As a precautionary measure and to get a reference file, the actual status of the CU NVRAM should be downloaded before the flash release 3.7 is loaded:

AGenT / Acceptance / Backup Filename: CUxxxxxx (xxxxxx = 6-digit serial number of the generator base, file size about 700kB, loading time about 15 minutes).

- Keep the PC <> generator data connection established.
- Switch the generator OFF.
- Leave the AGenT program with *AGenT / File / Exit.*

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7. LOADING OF GENERATOR CU FIRMWARE RELEASE 3.7

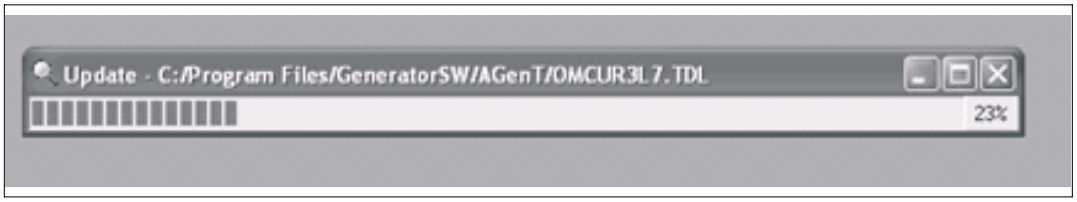
NOTE

Connection between service PC and generator must be established. For the update of data the service PC must be operated on mains. It must not be operated with batteries.
The screensaver must be deactivated.

- Switch the generator ON.
- Select menu:
  AGenT / Program / Update Generator Firmware (XRG 90 RAD/RF,C)
- Select the respective update file (OMCUR3Lx.TDL) and click on ”Open” with the left mouse button.

The reset can be performed within the next forty seconds, either on PCB EZ 139 S1
or on the ON button of the control module.

During the update process a progress bar is displayed on the screen which indicates how much of the update is completed.



Depending on the type of PC data transmission takes 15 ... 30min.
During this process all red LEDs of the function unit are blinking.

CAUTION

When the data transmission to the generator is completed, the message to wait for two minutes appears on the screen.

This process must under no circumstances be disturbed! At the end of this sensible procedure “Flash loaded ok” appears on the screen. Only now the AGenT program can be terminated.

- Reset the generator.

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7.1. TUBE DATA FILE UPGRADE

Tube data for the temperature calculation have been improved.

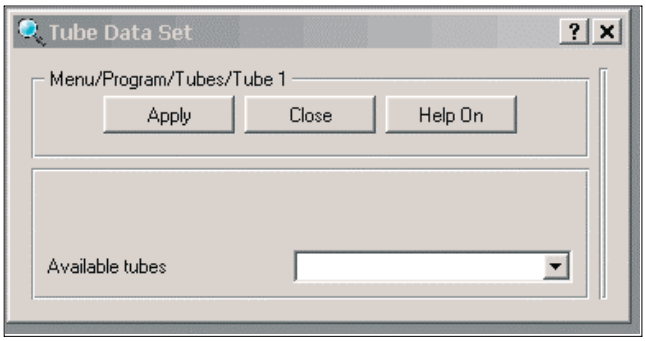
This requires that all tubes have to be re-programmed followed by a re-adaptation.

The generator must still be disconnected from the system CAN during tube data loading (TUBE_R3.TDL file date 18.4.2001).

7.1.1. Tube data set

The loading process

- Select menu:
  AGenT / Program / Tubes / Tube 1 ... 3 / ***Tube Data Set***



- Click on the arrow with the left mouse button in field “Available tubes“ . All the permitted combinatins of tube and housing type are listed in a window.
- Select the respective combination of tube type and housing type from the list and click on “Apply” with the left mouse button.
- Reset the generaor.Then the data which have been configured up to now are read by the processor when the system is started.

7.1.2. Tube adaptation

All filaments have to be adapted afterwards. If possible, monitor the kV waveform during adaptation.

WARNING

Radiation is released during the adaptation procedure!

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7.1.2.1. General information

Tube adaptation is an automatic process which includes:

1. The measurement of the mA offset value that is caused by:
   - the kV measuring circuit
   - the emission current feedback circuit (VCO).

2. The measurement of the individual standby filament current (based on 100μA).

3. The emission current characteristic as f (kV, filament current).

4. The dynamic behavior (positive and negative boost adaptation) where the inertia of the filament with respect to heating up and cooling down is registered.

NOTE

In case of problems check the symptom / solution list at the end of this adjustment chapter. Repeat the adaptation for this particular focus.

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7.1.2.2. Preconditions / Program settings

- Switch OFF the generator.

Preparation of generators which are connected via a CAN interface:

- BuckyDiagnost TH and TH2
- DigitalDiagnost
- Thoravision

- Disconnect the following plugs:

System	Connector		
	EZX23 signal bus	EZX42 or EZX42−1 system CAN	EZX43 or EZX43−1 system CAN
BuckyDiagnost TH / TH2	X		X
DigitalDiagnost	X	X	X
Thoravision	X	X	X

- Switch ON the generator.

NOTE

The adaption procedure must not be started before relay ENK1 has been energized at least 2 minutes after the generator has been switched ON.

- The tube must be conditioned as described in chapter 9. “Tube conditioning”.
- Check the upper kV limit
  Select menu AGenT:
  Program / Tubes / Tube Limits / ***Max. Tube Voltage Limit [kV].***

  The programmed value should match the nominal value of the tube connected or in case of older tubes the upper kV limit should be set to the max. application kV.
  Once an adaptation is completed the new limit value is indicated as ADAPTED TO [kV].
- Perform the following program settings temporarily for each tube connected to one of the assigned RGDVs = Free cassette
  Select menu AGenT:
  Program / RGDV set A + B / RGDV 1 ... 8 / ***Data Set A***

Programming	Temporarily	Original tube
Enable handswitch	YES	Verify the customized entries in 2Z−2.x at the end of this manual
Syncmaster present	NO	
Exposure switch type	Double step	
Exposure series / Tomo	YES	
Mounted radiographic	NONE	

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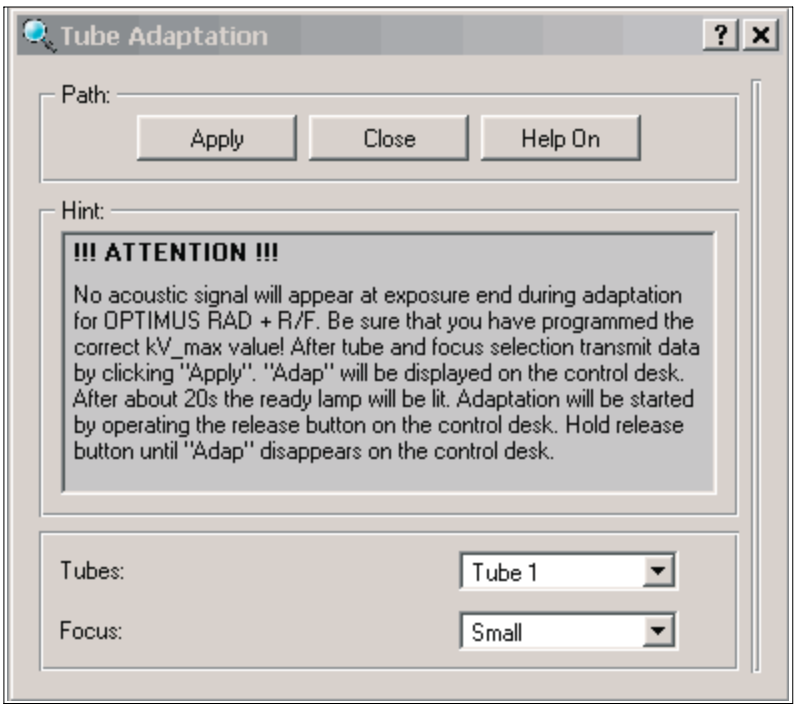
7.1.2.3. Procedure

- Reset the generator.
- It is recommended that the high voltage be monitored during adaptation.
  Connect the scope:
  Channel1: kV AV HT at EZ130 X3 (1V/div), scale: 20kV/V
  Trigger external: CTRL_X_C/ at backpanel EZ X74, negative slope
  Time base: 2ms/div
- Select the RGDV = Free cassette for the tube to be adapted.
- Select menu AGenT:
  *Adjustment / **Tube Adaptation***
- Select the tube and focus to be adapted, start with the small focus!


Tube Adaptation
Path:
Apply
Close
Help On
Hint:
!!! ATTENTION !!!
No acoustic signal will appear at exposure end during adaptation for OPTIMUS RAD + R/F. Be sure that you have programmed the correct kV_max value! After tube and focus selection transmit data by clicking "Apply". "Adap" will be displayed on the control desk. After about 20s the ready lamp will be lit. Adaptation will be started by operating the release button on the control desk. Hold release button until "Adap" disappears on the control desk.
Tubes:
Tube 1
Focus:
Small

NOTE

To avoid any malfunction make sure that READY is displayed on the desk before data are transmitted by clicking on “Apply” with the left mouse button:
READY state disappears, ADAP is displayed on the desk.
Wait until the generator turns back to the READY state.

- Start the adaptation process by pushing the handswitch in PREP and EXP position and keep it depressed in the EXP position.

  The generator switches about 125 exposures for each focus. The radiation sign at the desk indicates exposures but there is no beep at the end of each exposure.

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The actual kV parameters are displayed during adaptation.

The generator carries out the adaptation automatically. The procedure for one focus is completed when the desk indication changes from ADAP to TEST. At the end of the adaptation process the following message appears on the PC screen: “Before continueing the generator must be reset”.

- Reset the generator.
- Run the adaptation for each focus (small and large) and tube.

NOTE

As there is no tube type with a physical third (middle) focus yet, the third focus cannot be adapted. VARIOFOCUS values are calculated by adapted small and large focus. APR programs using VARIOFOCUS can only be selected until small and large focus are both adapted.

- Set the RGDV(s) program setting to original status according to table “RGDV programming” 2Z−2.x at the end of this manual.

7.1.3. Final tube adjustment work

1. BuckyDiagnost TH with CAN interface, DigitalDiagnost, Thoravision:
   - Switch OFF the generator.
   - Reconnect signal bus connector EZX23.
   - Reconnect CAN connectors EZX42−1 and EZX43−1.
   - Switch ON the generator.
2. All other systems:
   - Reset the generator

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7.1.4. Tubes

NOTE

Generators which are connected by a CAN interface have to be prepared as described below.

Preparation for:

- BuckyDiagnost TH and TH2
- DigitalDiagnost
- Thoravision
- EasyDiagnost with Bucky unit

• Disconnect the following plugs:

System	Connector		
	EZX23 signal bus	EZX42 or EZX42−1 system CAN	EZX43 or EZX43−1 system CAN
BuckyDiagnost TH / TH2	X		X
DigitalDiagnost	X	X	X
Thoravision	X	X	X
EasyDiagnost with Bucky unit	X	X	X

• Switch ON the generator.

NOTE

The download procedure must not be started before relay ENK1 has been energized at least 2 minutes after the generator has been switched ON.

Do not care if the generator is not programmed yet.

In the error log index (path: *AGenT / Fault Find / Error log*) there is a 00XQ entry.

It indicates ”Tube statistic data invalid” as the tube load table changed its format.

Release 3.7 has a detailed table now.

All tube counters of the predecessor release are empty after flash load of release 3.7.

Details and a table of the new counter table can be found in chapter 10. ”Exposure counter” at the end of this manual.

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8. FINAL WORK AND REMARKS ON THE CHANGES

There are no changes which can be recognized at first sight.

8.1. SETTINGS

No programming screen has to be adapted to the new level 7 of release 3 after the flash load, but some changes of settings have to be carried out:

Tomography auxiliary settings have to be modified for CAN controlled systems such as
Bucky TH, TH2, DigitalDiagnost, Bucky unit attached to an Easy Diagnost:

RGDV 2 (6 at EasyDiagnost) Data Set A (see pages 2Z−2.2 + 2Z−2.5 + 2Z−2.7) at the end of this manual

Exposure series / Tomo movement: **No**

RGDV 2 (6 at EasyDiagnost) Data Set B (see pages 2Z−2.2 + 2Z−2.5 + 2Z−2.7) at the end of this manual

Underexposure display (non automatic techniques): **Yes**

8.2. THE NAMES IN THE SCREEN

AGent / Program / RGDV set A + B / RGDV 1 ... 8 / Data Set A
of the programmed ”Mounted radiographic controller”

changed from

Bucky Controller 1 into Bucky Ctrl. 1/Dig.Diag.

and

Thorav./Dig.Bucky into Thoravision.

8.3. APR DATA

If APR data have to be adapted to the different max. dose correction, re−load the modified APR data file to the generator now.

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8.4. ERROR LOG

The error log index can be erased if there are no entries which require service work:
AGenT / Fault Find / Error Log
Click on “Clear” with the left mouse button.

8.5. CMOS BACKUP

It is advisable to download a CMOS backup to the local backup disk with the new firmware format:
AGenT / Acceptance / Backup

8.6. SYSTEM-CAN-BUS CONNECTED SYSTEMS

- The RGDV settings have to be set to its original configuration.
- Switch OFF the generator.
- Re−establish CAN connections EZX42 / 43 (or EZX42−1 / 43−1) and signalbus EZX23.
- Switch ON the generator.

8.7. FUNCTIONAL TEST

- Carry out a system test with all techniques, all chambers and all system functions.

8.8. DOKUMENTATION CHANGE

Replace the generator manual present on site with the documentation CD “UK OPTIMUS RAD − R/F rel. 3.7” .

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9. TUBE CONDITIONING

9.1. GENERAL

WARNING

Radiation is released during the conditioning procedure!

The generator must be in the READY state, i.e. the green ring at the desk must be illuminated.

9.2. PRECONDITIONS / PROGRAM SETTINGS

- Switch OFF the generator.

Preparation of generators which are connected via a CAN interface:

- BuckyDiagnost TH and TH2
- DigitalDiagnost
- Thoravision
- EasyDiagnost with bucky unit.

- Disconnect the following plugs.

System	Connector		
	EZX23 signal bus	EZX42 or EZX42−1 system CAN	EZX43 or EZX43−1 system CAN
BuckyDiagnost TH / TH2	X		X
DigitalDiagnost	X	X	X
Thoravision	X	X	X
EasyDiagnost with bucky unit	X	X	X

- Switch ON the generator.

NOTE

The programming procedure must not be started before relay ENK1 has been energized at least 2 minutes after the generator has been switched on.

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- Perform the following program settings temporarily for each tube connected to one of the assigned RGDVs = Free cassette
  Select menu AGenT:
  Program / RGDV set A + B / RGDV 1 ... 8 / Data Set A

Program setting	Temporarily	Original Tube
Enable handswitch	YES	
Syncmaster present	NO	
Exposure switch type	Double Step	
Exposure series / Tomo	YES	
Mounted radiographic	NONE	

- Reset the generator.
- Select appropriately programmed RGDV = “Free cassette” for the tube to be conditioned.

9.3. PROCEDURE

- Select **large** focus only.

NOTE

The generator must be in the READY state.

- Run reconditioning procedure for an adapted tube. Refer to the following table, left column “Tube adapted”.

or

- Run conditioning procedure for a new or non−adapted tube. Refer to the following table right column “Tube not adapted”.
- It is recommended that the high voltage be monitored during conditioning.
  Connect the scope:
  Channel1: kV AV HT at EZ130 X3 (1V/div), scale: 20kV/V
  Trigger external: CTRL_X_C/ at backpanel EZ X74, negative slope
  Time base: 2ms/div
- In case of problems like tube arcing see the following flowchart EXPOSURE SEQUENCE as an example.
  The flowchart applies to the applicable kV range only, e. g.:
  109kV is the max. kV value for normal application, set the next higher kV step = 117kV.

NOTE

Refer to flowchart EXPOSURE SEQUENCE.
If the tube arcs at a certain kV value, switch another three exposures with same parameters and 10s pause between subsequent exposures. In case of success (no arcing anymore) continue with next kV step of the following table.
*If the last exposure still arcs go one kV step back and follow the normal procedure. If this routine has been performed three times without improvement: ==> **Replace the tube!***

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Exposure parameters for conditioning

Tube adapted			# Exposures	Tube not adapted	
kV	mA	ms		kV	mAs
80	10	50	< 1 >	80	0.5
80	10	500	< 1 >	80	5
80	200	250	< 1 >	80	50
10 seconds pause				10 seconds pause	
80	max. mA	100	< 1 >	80	100
1 minute pause				1 minute pause	
90	10	50	< 1 >	90	0.5
90	10	500	< 1 >	90	5
90	200	250	< 1 >	90	50
10 seconds pause				10 seconds pause	
90	max. mA	100	< 1 >	90	100
1 minute pause				1 minute pause	
100	10	50	< 1 >	100	0.5
100	10	500	< 1 >	100	5
100	200	250	< 1 >	100	50
10 seconds pause				10 seconds pause	
100	max. mA	100	< 1 >	100	100
1 minute pause				1 minute pause	
110	10	50	< 1 >	110	0.5
110	10	500	< 1 >	110	5
110	200	250	< 1 >	110	50
10 seconds pause				10 seconds pause	
110	max. mA	100	< 1 >	110	100
1 minute pause				1 minute pause	
120	10	50	< 1 >	120	0.5
120	10	500	< 1 >	120	5
120	200	250	< 1 >	120	50
10 seconds pause				10 seconds pause	
120	max. mA	100	< 1 >	120	100
1 minute pause				1 minute pause	
130	10	50	< 1 >	130	0.5
130	10	500	< 1 >	130	5
130	200	250	< 1 >	130	50
10 seconds pause				10 seconds pause	
130	max. mA	100	< 1 >	130	100
1 minute pause				1 minute pause	

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Exposure parameters for conditioning

Tube adapted			# Exposures	Tube not adapted	
kV	mA	ms		kV	mAs
140	10	50	< 1 >	140	0.5
140	10	500	< 1 >	140	5
140	200	250	< 1 >	140	50
10 seconds pause				10 seconds pause	
140	max. mA	100	< 1 >	140	100
1 minute pause				1 minute pause	
145	10	50	< 1 >	145	0.5
145	10	500	< 1 >	145	5
145	200	250	< 1 >	145	50
10 seconds pause				10 seconds pause	
145	max. mA	100	< 1 >	145	100
1 minute pause				1 minute pause	
148	10	50	< 1 >	148	0.5
148	10	500	< 1 >	148	5
148	200	250	< 1 >	148	50
10 seconds pause				10 seconds pause	
148	max. mA	100	< 1 >	148	100
1 minute pause				1 minute pause	
150	10	50	< 1 >	150	0.5
150	10	500	< 1 >	150	5
150	200	250	< 1 >	150	50
10 seconds pause				10 seconds pause	
150	max. mA	100	< 1 >	150	100
1 minute pause				1 minute pause	

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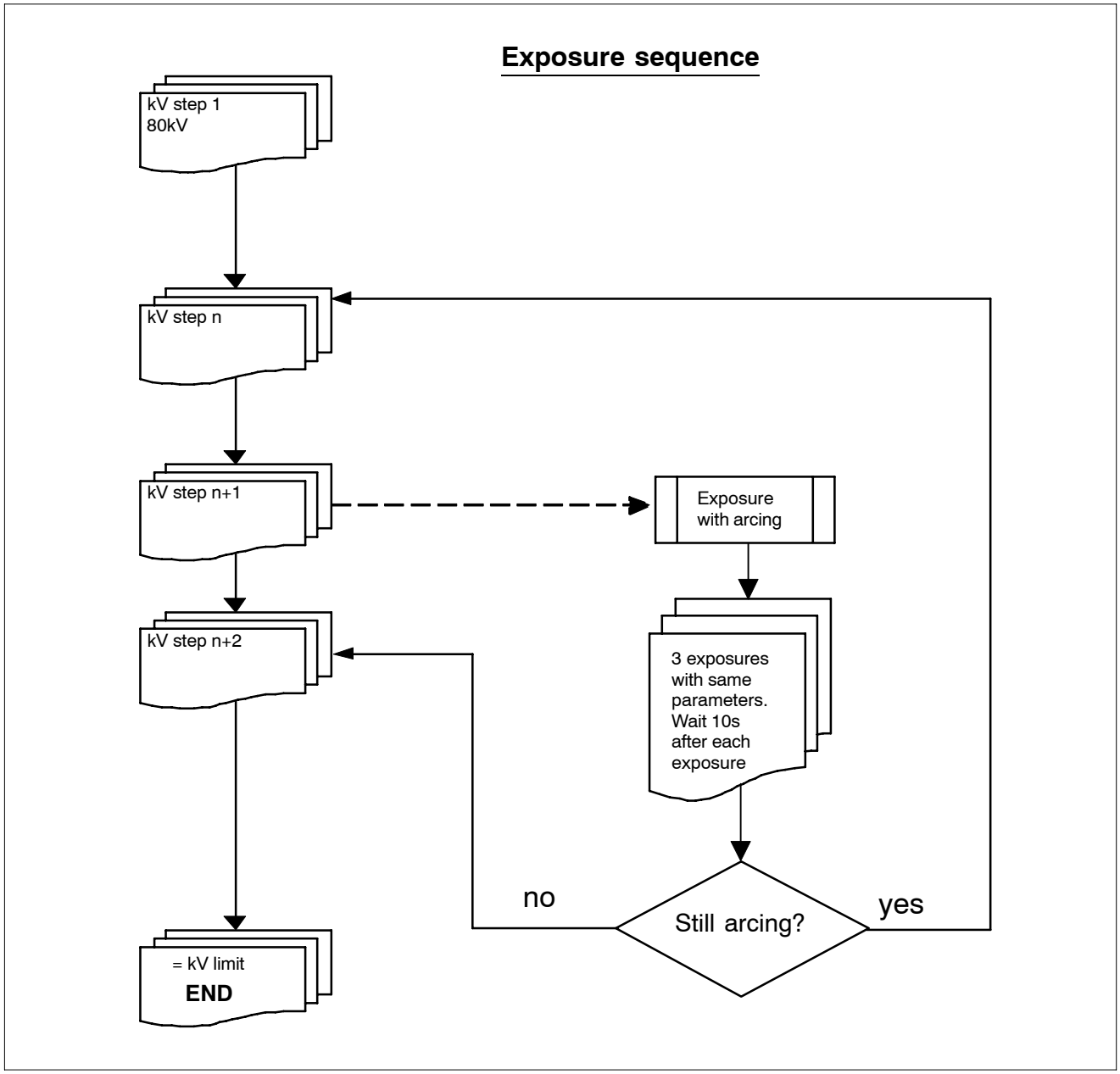

NOTE

If a tube arcs at any kV value which is not required for application, program the max. application kV value with AGenT:
Program / Tubes / Tube Limits / Max. Tube Voltage Limit [kV] / [117]

As the max. kV value has decreased now, the field ADAPTED TO [kV] displays the max. value after adaptation as well.

- Set the RGDV programming to the original status if no adaptation procedure has to be executed.
- Reset the generator.

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10. EXPOSURE COUNTER

Before handing over the generator to the customer, read the exposure counter.
Use menu:
Acceptance / Inspect / Tube 1 ... 3 / Type and statistic of Tube 1 ... 3
Record the figure in the table below.

NOTE

*Tube load statistic variables written on a grey background and marked by a "*****" are visible but do not affect the functions of this generator RAD type. (They are made for generators R/F version).*

Tube load statistic variable	Unit	Tube1	Tube 2	Tube 3
Reset date	dd.mm.yy			
Last update	dd.mm.yy			
Preparation time large focus	s			
Preparation time small focus	s			
Preparation time vario focus	s			
Preparation counter large focus	1			
Preparation counter small focus	1			
Preparation counter vario focus	1			
***** Fluoro time	min			
***** Fluoro counter	1			
Exposure counter large focus	1			
Exposure counter small focus	1			
Exposure counter vario focus	1			
Overload exposures counter large focus	1			
Overload exposures counter small focus	1			
Overload exposures counter vario focus	1			

The tables should be reset whenever the tubes are being replaced.
Use menu:
Acceptance / Inspect / Tube 1 ... 3 / Type and statistic of Tube 1 ... 3
Click on "Reset" with the left mouse button.
Record the figure in the table above.

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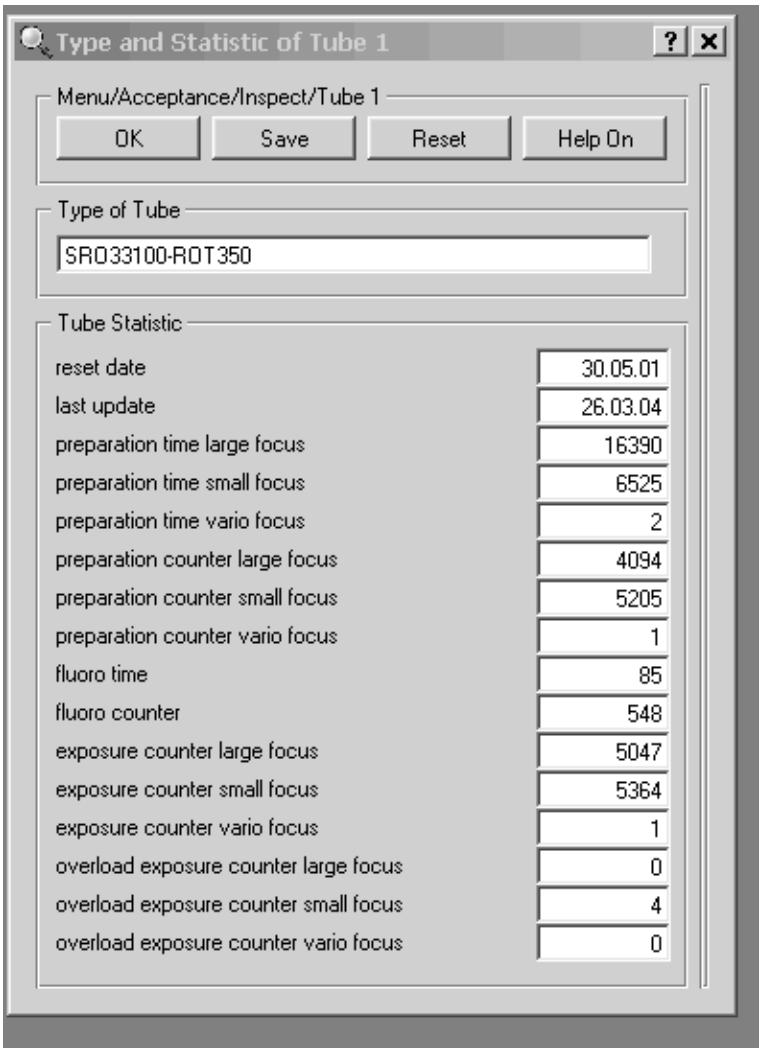

Explanation:

Reset date / **Last update:**
Reset date and date of last update of the tube statistic.

Preparation time:
The sum of all preparation times per focus.

Preparation counter:
Counts the occurrences of transition STANDBY or FLUORO to PREPARATION per focus.

*** Fluoro time:**
The sum of all fluoro times.

*** Fluoro counter:**
Counts the fluoro commands.

Exposure counter:
Counts the exposures per focus (including the overload exposures).

Overload exposures counter:
Counts the exposures at overload conditions of the tube.

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CSIP Level 0 (01.0)

RGDV programming

2Z-2.0

– ***Name :***								
–								
Data Set A : Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :								
– Tube :								
– Release circuit number :								
– Enable handswitch at generator desk :								
– Syncmaster present :								
– Exposure switch type :								
– Bucky format density correction :								
– Cone density correction :								
– Dose measurement input :								
– Dose measurement sensor :								
– Exposure series/Tomo movement (No break after exposure end):								
– Release delay :								
– Mounted radiographical controller :								
– Release circuit adaptation unit :								
– Mounted tomo extension :								
– Medium II format kV correction (dose equiv. steps) :								
– Medium II format density correction (6% steps) :								
– Medium II format mAs correction (6% steps) :								
– Small II format kV correction (dose equiv. steps) :								
– Small II format density correction (6% steps) :								
– Small II format mAs correction (6% steps) :								
Data Set B :								
– Used for tomo :								
– Used for fluoroscopy :								
– CT add on :								
– Disable time override :								
– Tube power factor :								
– kV steps :								
– mAs steps :								
– mA steps :								
– time steps :								
– Density steps :								
– Density correction (6% steps) :								
– Underexposure display :								
– Tube overload protection :								

Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :		**Bucky / Tomo 1WA : Decade Bucky 1/2**	**WAX11**	**WAX12**	**Bucky / Tomo 1WA \ Tomo time [s] :**			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch			Tomo time 1 :		Tomo time 5 :	
		Bucky RGDV – switch related			Tomo time 2 :		Tomo time 6 :	
		Bucky RGDV			Tomo time 3 :		Tomo time 7 :	
		Bucky RGDV			Tomo time 4 :		Tomo time 8 :	
		Tomo RGDV – switch related			Time setting for input at WA X21:1 8			
For WBX11 : 9 –-10 (ready) und 1-–2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –-> Bucky – Tomo remote switchover RGDVs*						

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– ***D76 : Exposure Scopo / BV-DSI*** **Name :** – *Bucky wall stand / – Free cassette*		D 76 Scopo	D 76 BV – DSI	Bucky wall stand	Free cassette	Free cassette USA			
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV4	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1	1			
– Tube :		1	1	2	1	1			
– Release circuit number :		1	2	3	(4)	4			
– Enable handswitch at generator desk :		no	no	yes	yes	yes			
– Syncmaster present :		yes	yes	yes	no	yes			
– Exposure switch type :		double step	double step	double step	double step	double step			
– Bucky format density correction :		0	0	0	0	0			
– Cone density correction :		0	0	0	0	0			
– Dose measurement input :		EZ X21	EZ X41	EZ X31	none	none			
– Dose measurement sensor :		Scopo amplimat	photo sensor/ amplimat input	Bucky amplimat	(Bucky amplimat)	(Bucky amplimat)			
– Exposure series :		yes	yes	no	no	no			
– Release delay :		enable	enable	enable	enable	enable			
– Mounted radiographical controller :		none	none	none	none	none			
– Release circuit adaptation unit :		1WB	1WB	1WB	none	1WB			
– Mounted tomo extension :		none	none	none	none	none			
– Medium II format kV correction (dose equiv. steps) :		0	0 [1)]	0	0	0			
– Medium II format density correction (6% steps) :		0	0 [1)]	0	0	0			
– Medium II format mAs correction (6% steps) :		0	0 [1)]	0	0	0			
– Small II format kV correction (dose equiv. steps) :		0	0 [1)]	0	0	0			
– Small II format density correction (6% steps) :		0	0 [1)]	0	0	0			
– Small II format mAs correction (6% steps) :		0	0 [1)]	0	0	0			
Data Set B :									
– Used for tomo :		no	no	no	no	no			
– Used for fluoroscopy :		yes	yes	no	no	no			
– CT add on :		no	no	no	no	no			
– Disable time override :		no	no	no	no	no			
– Tube power factor :		100 %	100 %	100 %	100 %	100 %			
– kV steps :		Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]			
– mAs steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]			
– mA steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]			
– time steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]			
– Density steps :		12 % [1)]	12 % [1)]	12 % [1)]	12 % [1)]	12 %			
– Density correction (6% steps) :		0	0	0	0	0			
– Underexposure display :		yes	yes	yes	yes	yes			
– Tube overload protection :		on	on	on	on	on			

Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :		**~~Bucky / Tomo 1WA : Decade Bucky 1/2~~**	**WAX11**	**WAX12**	**~~Bucky / Tomo 1WA \ Tomo time [s] :~~**			
Bucky RGDV :	RGDV1 [x] RGDV2 [x] RGDV3 [x] RGDV4 [x] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 --10 (ready) und 1--2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 --> Bucky – Tomo remote switchover RGDVs*						

1) = has to be adjustet on site

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RGDV programming: example 1

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RGDV programming: example 2

– Bucky Diagnost TH with Bucky–Controller ***Name :*** ***– D76 : Exposure Scopo / BV–DSI***	Bucky	Tomo	Bucky wall stand	Free cassette	D 76 Scopo	D 76 BV – DSI		
Data Set A : Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :	1	1	1	1	1	1		
– Tube :	1	1	1	1	2	2		
– Release circuit number :	do not care	do not care	do not care	do not care	1	2		
– Enable handswitch at generator desk :	yes	yes	yes	yes	no	no		
– Syncmaster present :	yes	yes	yes	yes	yes	yes		
– Exposure switch type :	double step	double step	double step	double step	double step	double step		
– Bucky format density correction :	0	0	0	0	0	0		
– Cone density correction :	0	0	0	0	0	0		
– Dose measurement input :	EZ X21	none / [EZ X21]	EZ X31	none	EZ X22	EZ X41		
– Dose measurement sensor :	Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)	Scopo amplimat	photo sensor / amplimat input		
– Exposure series/Tomo movement :	no	no	no	no	yes	yes		
– Release delay :	enable	enable	enable	enable	enable	enable		
– Mounted radiographical controller :	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	none	none		
– Release circuit adaptation unit :	none	none	none	none	1WB	1WB		
– Mounted tomo extension :	none	none	none	none	none	none		
– Medium II format kV correction (dose equiv. steps) :	0	0	0	0	0	0 [1)]		
– Medium II format density correction (6% steps) :	0	0	0	0	0	0 [1)]		
– Medium II format mAs correction (6% steps) :	0	0	0	0	0	0 [1)]		
– Small II format kV correction (dose equiv. steps) :	0	0	0	0	0	0 [1)]		
– Small II format density correction (6% steps) :	0	0	0	0	0	0 [1)]		
– Small II format mAs correction (6% steps) :	0	0	0	0	0	0 [1)]		
Data Set B :								
– Used for tomo :	no	yes	no	no	no	no		
– Used for fluoroscopy :	no	no	no	no	yes	yes		
– CT add on :	no	no	no	no	no	no		
– Disable time override :	no	no	no	no	no	no		
– Tube power factor :	100 %	100 %	100 %	100 %	100 %	100 %		
– kV steps :	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]		
– mAs steps :	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– mA steps :	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– time steps :	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– Density steps :	12 % [1)]	12 % [1)]	12 % [1)]	12 %	12 % [1)]	12 %		
– Density correction (6% steps) :	0	0	0	0	0	0		
– Underexposure display :	yes	yes	yes	yes	yes	yes		
– Tube overload protection :	on	on	on	on	on	on		

Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :		~~**Bucky / Tomo 1WA : Decade Bucky 1/2**~~	~~**WAX11**~~	~~**WAX12**~~	~~**Bucky / Tomo 1WA \ Tomo time [s] :**~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [**x**] RGDV6 [**x**] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 –-10 (ready) und 1–-2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –-> Bucky – Tomo remote switchover RGDVs*						

1) = has to be adjustet on site

[ ] = TDC

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– *D96 : Cassette+DSI with/without Tomo* – *Bucky wall stand* / – *Free cassette*	*Name :*	D96 cassette	D96 Tomo cassette	DSI	DSI Tomo	Free cassette	Wall stand		
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1	1	1		
– Tube :		1	1	1	1	2	2		
– Release circuit number :		1	2	3	4	1	2		
– Enable handswitch at generator desk :		no	no	no	no	yes	yes		
– Syncmaster present :		yes	yes	yes	yes	yes	yes		
– Exposure switch type :		double step	double step	double step	double step	double step	double step		
– Bucky format density correction :		0	0	0	0	0	0		
– Cone density correction :		0	0	0	0	0	0		
– Dose measurement input :		EZX 21	none / [EZX 21]	EZX 41	none / [EZX 41]	none	EZX 31		
– Dose measurement sensor :		Bucky amplimat	Bucky amplimat	photo sensor/ amplimat input	(photo sensor/ amplimat input)	(Bucky amplimat)	Bucky amplimat		
– Exposure series/Tomo movement :		yes	yes	yes	yes	no	no		
– Release delay :		enable	enable	enable	enable	enable	enable		
– Mounted radiographical controller :		none	none	none	none	none	none		
– Release circuit adaptation unit :		1WB	1WB	1WB	1WB	1WA	1WA		
– Mounted tomo extension :		1WA	1WA	1WA	1WA	none	none		
– Medium II format kV correction (dose equiv. steps) :		0	0	0 [1)]	0 [1)]	0	0		
– Medium II format density correction (6% steps) :		0	0	0 [1)]	0 [1)]	0	0		
– Medium II format mAs correction (6% steps) :		0	0	0 [1)]	0 [1)]	0	0		
– Small II format kV correction (dose equiv. steps) :		0	0	0 [1)]	0 [1)]	0	0		
– Small II format density correction (6% steps) :		0	0	0 [1)]	0 [1)]	0	0		
– Small II format mAs correction (6% steps) :		0	0	0 [1)]	0 [1)]	0	0		
Data Set B :									
– Used for tomo :		no	yes	no	yes	no	no		
– Used for fluoroscopy :		yes	yes	yes	yes	no	no		
– CT add on :		no	no	no	no	no	no		
– Disable time override :		no	no	no	no	no	no		
– Tube power factor :		100 %	100 %	100 %	100 %	100 %	100 %		
– kV steps :		Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]	Dose equiv. [1)]		
– mAs steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– mA steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– time steps :		25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]	25 % [1)]		
– Density steps :		12 % [1)]	12 % [1)]	12 %	12 %	12 %	12 % [1)]		
– Density correction (6% steps) :		0	0	0	0	0	0		
– Underexposure display :		yes	no	yes	no	yes	yes		
– Tube overload protection :		on	on	on	on	on	on		

Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :		**Bucky / Tomo 1WA : Decade Bucky 1/2**	**WAX11**	**WAX12**	**Bucky / Tomo 1WA \ Tomo time [s] :**			
Bucky RGDV :	RGDV1 [x] RGDV2 [x] RGDV3 [x] RGDV4 [x] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	enable	enable	Tomo time 1 :	0,6	Tomo time 5 :	3,0
		Bucky RGDV – switch related	RGDV 1	RGDV 3	Tomo time 2 :	0,3	Tomo time 6 :	1,5
		Bucky RGDV	none	none	Tomo time 3 :	1,5	Tomo time 7 :	1,0
		Bucky RGDV	none	none	Tomo time 4 :	0,7	Tomo time 8 :	1,0
		Tomo RGDV – switch related	RGDV 2	RGDV 4	Time setting for input at WA X21:1 8			
For WBX11 : 9 –-10 (ready) und 1–-2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –-> Bucky – Tomo remote switchover RGDVs*						

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[ ] = TDC

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RGDV programming: example 3

HDH : *without / [with tomo time input]*	***Name :***	Bucky	Tomo	Bucky wall stand	Free cassette	Free cassette USA			
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV4	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1	1			
– Tube :		1	1	1	1	1			
– Release circuit number :		1	1	3	(4)	4			
– Enable handswitch at generator desk :		yes	yes	yes	yes	yes			
– Syncmaster present :		yes	yes	yes	no	yes			
– Exposure switch type :		double step	double step	double step	double step	double step			
– Bucky format density correction :		0	0	0	0	0			
– Cone density correction :		0	0	0	0	0			
– Dose measurement input :		EZ X21	none / [EZ X21]	EZ X31	none	none			
– Dose measurement sensor :		Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)	(Bucky amplimat)			
– Exposure series / Tomo movement :		no	yes	no	no	no			
– Release delay :		enable	enable	enable	enable	enable			
– Mounted radiographical controller :		none	none	none	none	none			
– Release circuit adaptation unit :		1WA	1WA	1WA	none	1WA			
– Mounted tomo extension :		none	none (1WA)	none	none	none			
– Medium II format kV correction (dose equiv. steps) :		0	0	0	0	0			
– Medium II format density correction (6% steps) :		0	0	0	0	0			
– Medium II format mAs correction (6% steps) :		0	0	0	0	0			
– Small II format kV correction (dose equiv. steps) :		0	0	0	0	0			
– Small II format density correction (6% steps) :		0	0	0	0	0			
– Small II format mAs correction (6% steps) :		0	0	0	0	0			
Data Set B :									
– Used for tomo :		no	no (yes)	no	no	no			
– Used for fluoroscopy :		no	no	no	no	no			
– CT add on :		no	no	no	no	no			
– Disable time override :		no	no	no	no	no			
– Tube power factor :		100 %	100 %	100 %	100 %	100 %			
– kV steps :		Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)			
– mAs steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– mA steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– time steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– Density steps :		12 % 1)	12 % 1)	12 % 1)	12 %	12 %			
– Density correction (6% steps) :		0	0	0	0	0			
– Underexposure display :		yes	no	yes	yes	yes			
– Tube overload protection :		on	on	on	on	on			

~~**Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :**~~		**Bucky / Tomo 1WA : Decade Bucky 1/2**	**WAX11**	**WAX12**	**Bucky / Tomo 1WA \ Tomo time [s] :**			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	dis(en)able	disable	Tomo time 1 :	0,8	Tomo time 5 :	0,1
		Bucky RGDV – switch related	RGDV 1	none	Tomo time 2 :	3,2	Tomo time 6 :	0,1
		Bucky RGDV	RGDV 3	none	Tomo time 3 :	0,8	Tomo time 7 :	0,1
		Bucky RGDV	none	none	Tomo time 4 :	3,2	Tomo time 8 :	0,1
		Tomo RGDV – switch related	RGDV 2	none	Time setting for input at WA X21:1 8			
For WBX11 : 9 –-10 (ready) und 1–-2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –-> Bucky – Tomo remote switchover RGDVs*						

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BuckyDIAGNOST with Bucky–Controller TH / TH2 / VR / DigitalDiagnost sensing / none sensing with tomo	***Name :***	Bucky table	Tomo	Bucky wall stand	Free cassette				
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1				
– Tube :		1	1	1	1				
– Release circuit number :		do not care	do not care	do not care	do not care				
– Enable handswitch at generator desk :		yes	yes	yes	yes				
– Syncmaster present :		yes	yes	yes	yes				
– Exposure switch type :		double step	double step	double step	double step				
– Bucky format density correction :		0	0	0	0				
– Cone density correction :		0	0	0	0				
– Dose measurement input :		EZ X21	none / [EZ X21]	EZ X31	none				
– Dose measurement sensor :		Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)				
– Exposure series / Tomo movement :		no	yes	no	no				
– Release delay :		enable	enable	enable	enable				
– Mounted radiographical controller :		Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost				
– Release circuit adaptation unit :		none	none	none	none				
– Mounted tomo extension :		none	none	none	none				
– Medium II format kV correction (dose equiv. steps) :		0	0	0	0				
– Medium II format density correction (6% steps) :		0	0	0	0				
– Medium II format mAs correction (6% steps) :		0	0	0	0				
– Small II format kV correction (dose equiv. steps) :		0	0	0	0				
– Small II format density correction (6% steps) :		0	0	0	0				
– Small II format mAs correction (6% steps) :		0	0	0	0				
Data Set B :									
– Used for tomo :		no	yes	no	no				
– Used for fluoroscopy :		no	no	no	no				
– CT add on :		no	no	no	no				
– Disable time override :		no	no	no	no				
– Tube power factor :		100 %	100 %	100 %	100 %				
– kV steps :		Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)				
– mAs steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– mA steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– time steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– Density steps :		12 % 1)	12 % 1)	12 % 1)	12 %				
– Density correction (6% steps) :		0	0	0	0				
– Underexposure display :		yes	yes	yes	yes				
– Tube overload protection :		on	on	on	on				

~~**Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :**~~		~~**Bucky / Tomo 1WA : Decade Bucky 1/2**~~	~~**WAX11**~~	~~**WAX12**~~	~~**Bucky / Tomo time**~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –> Bucky – Tomo remote switchover RGDVs*						

Programmings are only necessary if RGDV is present in system configuration

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RGDV programming: example 5

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RGDV programming: example 6

CSIP Level 0 (01.0)

2Z–2.6

BuckyDIAGNOST TS	***Name :***	Bucky	Tomo	Bucky wall stand	Free cassette				
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1				
– Tube :		1	1	1	1				
– Release circuit number :		1	1	2	(1)				
– Enable handswitch at generator desk :		yes	yes	yes	yes				
– Syncmaster present :		yes	yes	yes	no				
– Exposure switch type :		double step	double step	double step	double step				
– Bucky format density correction :		0	0	0	0				
– Cone density correction :		0	0	0	0				
– Dose measurement input :		EZ X21	none / [EZX21]	EZ X31	none				
– Dose measurement sensor :		Bucky amplimat	Bucky amplimat	Bucky amplimat	Bucky amplimat				
– Exposure series / Tomo movement :		no	yes	no	no				
– Release delay :		enable	enable	enable	enable				
– Mounted radiographical controller :		none	none	none	none				
– Release circuit adaptation unit :		1WA	1WA	1WA	none				
– Mounted tomo extension :		none	1WA	none	none				
– Medium II format kV correction (dose equiv. steps) :		0	0	0	0				
– Medium II format density correction (6% steps) :		0	0	0	0				
– Medium II format mAs correction (6% steps) :		0	0	0	0				
– Small II format kV correction (dose equiv. steps) :		0	0	0	0				
– Small II format density correction (6% steps) :		0	0	0	0				
– Small II format mAs correction (6% steps) :		0	0	0	0				
Data Set B :									
– Used for tomo :		no	yes	no	no				
– Used for fluoroscopy :		no	no	no	no				
– CT add on :		no	no	no	no				
– Disable time override :		no	no	no	no				
– Tube power factor :		100 %	100 %	100 %	100 %				
– kV steps :		Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose eqiv. 1)				
– mAs steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– mA steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– time steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)				
– Density steps :		12 % 1)	12 % 1)	12 % 1)	12 %				
– Density correction (6% steps) :		0	0	0	0				
– Underexposure display :		yes	no	yes	yes				
– Tube overload protection :		on	on	on	on				

~~**Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :**~~		**Bucky / Tomo 1WA : Decade Bucky 1/2**	**WAX11**	**WAX12**	~~**Bucky / Tomo time**~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	enable	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	RGDV1	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	none	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	none	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	RGDV2	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 ––> Bucky – Tomo remote switchover RGDVs*						

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RGDV programming: example 7

CSIP Level 0 (01.0)

2Z-2.7

EASYDIAGNOST including CAN controlled CS Bucky unit ***Name :***	Scopo	DSI			Bucky	Tomo	Bucky wall stand	Free cassette
Data Set A : Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :	1	1			1	1	1	1
– Tube :	1	1			2	2	2	2
– Release circuit number :	1	2			do not care	do not care	do not care	do not care
– Enable handswitch at generator desk :	no	no			yes	yes	yes	yes
– Syncmaster present :	yes	yes			yes	yes	yes	yes
– Exposure switch type :	double step	double step			double step	double step	double step	double step
– Bucky format density correction :	0	0			0	0	0	0
– Cone density correction :	0	0			0	0	0	0
– Dose measurement input :	EZ X21	EZ X41			EZ X31	none / [EZ X31]	EZ X32	none
– Dose measurement sensor :	Scopo amplimat	photo sensor/ amplimat input			Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)
– Exposure series / Tomo movement :	yes	yes			no	no	no	no
– Release delay :	enable	enable			enable	enable	enable	enable
– Mounted radiographical controller :	none	none			Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost
– Release circuit adaptation unit :	1WB	1WB			none	none	none	none
– Mounted tomo extension :	none	none			none	none	none	none
– Medium II format kV correction (dose equiv. steps) :	0	1 1)			0	0	0	0
– Medium II format density correction (6% steps) :	0	0 1)			0	0	0	0
– Medium II format mAs correction (6% steps) :	0	0 1)			0	0	0	0
– Small II format kV correction (dose equiv. steps) :	0	2 1)			0	0	0	0
– Small II format density correction (6% steps) :	0	0 1)			0	0	0	0
– Small II format mAs correction (6% steps) :	0	0 1)			0	0	0	0
Data Set B :								
– Used for tomo :	no	no			no	yes	no	no
– Used for fluoroscopy :	yes	yes			no	no	no	no
– CT add on :	no	no			no	no	no	no
– Disable time override :	no	no			no	no	no	no
– Tube power factor :	100 %	100 %			100 %	100 %	100 %	100 %
– kV steps :	Dose equiv. 1)	Dose equiv. 1)			Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)
– mAs steps :	25 % 1)	25 % 1)			25 % 1)	25 % 1)	25 % 1)	25 % 1)
– mA steps :	25 % 1)	25 % 1)			25 % 1)	25 % 1)	25 % 1)	25 % 1)
– time steps :	25 % 1)	25 % 1)			25 % 1)	25 % 1)	25 % 1)	25 % 1)
– Density steps :	12 % 1)	12 % 1)			12 % 1)	12 % 1)	12 % 1)	12 %
– Density correction (6% steps) :	0	0			0	0	0	0
– Underexposure display :	yes	yes			yes	yes	yes	yes
– Tube overload protection :	on	on			on	on	on	on

Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :		~~**Bucky / Tomo 1WA : Decade Bucky 1/2**~~	~~**WAX11**~~	~~**WAX12**~~	~~**Bucky / Tomo time**~~			
Bucky RGDV :	RGDV1 [X] RGDV2 [X] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –> Bucky – Tomo remote switchover RGDVs*						

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RGDV programming: example 8

CSIP Level 0 (01.0)

2Z–2.8

BuckyDIAGNOST TH any version with Bucky–Controller Generotor equipped with / without decade adapt. unit WA Aux. for MCS (only) = RGDV4 combined with free cassette	***Name :***	Bucky	Tomo	Bucky wall stand	Free cassette	MCS			
Data Set A :	Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV4	RGDV6	RGDV7	RGDV8
– Room :		1	1	1	1	1			
– Tube :		1	1	1	1	1			
– Release circuit number :		1	1	1	1	1			
– Enable handswitch at generator desk :		yes	yes	yes	yes	yes			
– Syncmaster present :		yes	yes	yes	yes	yes			
– Exposure switch type :		double step	double step	double step	double step	double step			
– Bucky format density correction :		0	0	0	0	0			
– Cone density correction :		0	0	0	0	0			
– Dose measurement input :		EZ X21	none / [EZ X21]	EZ X31	none	EZ X22			
– Dose measurement sensor :		Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)	Bucky amplimat			
– Exposure series / Tomo movement :		no	no	no	no	no			
– Release delay :		enable	enable	enable	enable	enable			
– Mounted radiographical controller :		Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost			
– Release circuit adaptation unit :		none	none	none	none	none			
– Mounted tomo extension :		none	none	none	none	none			
– Medium II format kV correction (dose equiv. steps) :		0	0	0	0	0			
– Medium II format density correction (6% steps) :		0	0	0	0	0			
– Medium II format mAs correction (6% steps) :		0	0	0	0	0			
– Small II format kV correction (dose equiv. steps) :		0	0	0	0	0			
– Small II format density correction (6% steps) :		0	0	0	0	0			
– Small II format mAs correction (6% steps) :		0	0	0	0	0			
Data Set B :									
– Used for tomo :		no	yes	no	no	no			
– Used for fluoroscopy :		no	no	no	no	no			
– CT add on :		no	no	no	no	no			
– Disable time override :		no	no	no	no	no			
– Tube power factor :		100 %	100 %	100 %	100 %	100 %			
– kV steps :		Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)			
– mAs steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– mA steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– time steps :		25 % 1)	25 % 1)	25 % 1)	25 % 1)	25 % 1)			
– Density steps :		12 % 1)	12 % 1)	12 % 1)	12 %	12 % 1)			
– Density correction (6% steps) :		0	0	0	0	0			
– Underexposure display :		yes	yes	yes	yes	yes			
– Tube overload protection :		on	on	on	on	on			

~~Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :~~		~~Bucky / Tomo 1WA : Decade Bucky 1/2~~	~~WAX11~~	~~WAX12~~	~~Bucky / Tomo time~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 –> Bucky – Tomo remote switchover RGDVs*						

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RGDV programming: example 9

BuckyDIAGNOST TH any version ***Name :*** ***Generotor equipped with / without decade adapt. unit WA*** ***Aux. for MCS (only) = any of RGDV5 ... 8***	Bucky	Tomo	Bucky wall stand	Free cassette				MCS
Data Set A : Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :	1	1	1	1				1
– Tube :	1	1	1	1				1
– Release circuit number :	1	1	1	1				1
– Enable handswitch at generator desk :	yes	yes	yes	yes				yes
– Syncmaster present :	yes	yes	yes	yes				no
– Exposure switch type :	double step	double step	double step	double step				double step
– Bucky format density correction :	0	0	0	0				0
– Cone density correction :	0	0	0	0				0
– Dose measurement input :	EZ X21	none / [EZ X21]	EZ X31	none				EZ X22
– Dose measurement sensor :	Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)				Bucky amplimat
– Exposure series / Tomo movement :	no	no	no	no				no
– Release delay :	enable	enable	enable	enable				enable
– Mounted radiographical controller :	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost				none
– Release circuit adaptation unit :	none	none	none	none				none
– Mounted tomo extension :	none	none	none	none				none
– Medium II format kV correction (dose equiv. steps) :	0	0	0	0				0
– Medium II format density correction (6% steps) :	0	0	0	0				0
– Medium II format mAs correction (6% steps) :	0	0	0	0				0
– Small II format kV correction (dose equiv. steps) :	0	0	0	0				0
– Small II format density correction (6% steps) :	0	0	0	0				0
– Small II format mAs correction (6% steps) :	0	0	0	0				0
Data Set B :								
– Used for tomo :	no	yes	no	no				no
– Used for fluoroscopy :	no	no	no	no				no
– CT add on :	no	no	no	no				no
– Disable time override :	no	no	no	no				no
– Tube power factor :	100 %	100 %	100 %	100 %				100 %
– kV steps :	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)				Dose equiv. 1)
– mAs steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– mA steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– time steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– Density steps :	12 % 1)	12 % 1)	12 % 1)	12 %				12 % 1)
– Density correction (6% steps) :	0	0	0	0				0
– Underexposure display :	yes	yes	yes	yes				yes
– Tube overload protection :	on	on	on	on				on

~~**Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :**~~		~~**Bucky / Tomo 1WA : Decade Bucky 1/2**~~	~~**WAX11**~~	~~**WAX12**~~	~~**Bucky / Tomo time**~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 ––> Bucky – Tomo remote switchover RGDVs*						

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RGDV programming: example 10

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2Z-2.10

BuckyDIAGNOST TH any version ***Name :*** ***Generotor equipped with / without decade adapt. unit WA*** ***Aux. for TraumaDiagnost (only) = any of RGDV5 ... 8*** ***Aux. RGDV1 ... 4 must not be used with a Bucky TH stystem via CAN***	Bucky	Tomo	Bucky wall stand	Free cassette				Trauma
Data Set A : Desk :	RGDV1	RGDV2	RGDV3	RGDV4	RGDV5	RGDV6	RGDV7	RGDV8
– Room :	1	1	1	1				1
– Tube :	1	1	1	1				2
– Release circuit number :	1	1	1	1				1
– Enable handswitch at generator desk :	yes	yes	yes	yes				yes
– Syncmaster present :	yes	yes	yes	yes				no
– Exposure switch type :	double step	double step	double step	double step				double step
– Bucky format density correction :	0	0	0	0				0
– Cone density correction :	0	0	0	0				0
– Dose measurement input :	EZ X21	none / [EZ X21]	EZ X31	none				EZ X22
– Dose measurement sensor :	Bucky amplimat	Bucky amplimat	Bucky amplimat	(Bucky amplimat)				Scopo amplimat
– Exposure series / Tomo movement :	no	no	no	no				no
– Release delay :	enable	enable	enable	enable				enable
– Mounted radiographical controller :	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost	Bucky contr. 1 / DigitalDiagnost				none
– Release circuit adaptation unit :	none	none	none	none				none
– Mounted tomo extension :	none	none	none	none				none
– Medium II format kV correction (dose equiv. steps) :	0	0	0	0				0
– Medium II format density correction (6% steps) :	0	0	0	0				0
– Medium II format mAs correction (6% steps) :	0	0	0	0				0
– Small II format kV correction (dose equiv. steps) :	0	0	0	0				0
– Small II format density correction (6% steps) :	0	0	0	0				0
– Small II format mAs correction (6% steps) :	0	0	0	0				0
Data Set B :								
– Used for tomo :	no	yes	no	no				no
– Used for fluoroscopy :	no	no	no	no				yes
– CT add on :	no	no	no	no				no
– Disable time override :	no	no	no	no				no
– Tube power factor :	100 %	100 %	100 %	100 %				100 %
– kV steps :	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)	Dose equiv. 1)				Dose equiv. 1)
– mAs steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– mA steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– time steps :	25 % 1)	25 % 1)	25 % 1)	25 % 1)				25 % 1)
– Density steps :	12 % 1)	12 % 1)	12 % 1)	12 %				12 % 1)
– Density correction (6% steps) :	0	0	0	0				0
– Underexposure display :	yes	yes	yes	yes				yes
– Tube overload protection :	on	on	on	on				on

~~Bucky / Scopo 1WB / Decade Bucky 1 (WBX11) :~~		~~Bucky / Tomo 1WA : Decade Bucky 1/2~~	~~WAX11~~	~~WAX12~~	~~Bucky / Tomo time~~			
Bucky RGDV :	RGDV1 [ ] RGDV2 [ ] RGDV3 [ ] RGDV4 [ ] RGDV5 [ ] RGDV6 [ ] RGDV7 [ ] RGDV8 [ ]	Tomo mode switch	----	----	Tomo time 1 :	----	Tomo time 5:	----
		Bucky RGDV – switch related	----	----	Tomo time 2 :	----	Tomo time 6 :	----
		Bucky RGDV	----	----	Tomo time 3 :	----	Tomo time 7 :	----
		Bucky RGDV	----	----	Tomo time 4 :	----	Tomo time 8 :	----
		Tomo RGDV – switch related	----	----	Time setting for input at WA X21:1 8			
For WBX11 : 9 ––10 (ready) und 1––2 (format size correction contact)		*Tomo mode switch : X11:3 SL_XG_TO / Bucky RGDV : X11:1 Format + :10 Bucky ready / Tomo RGDV : X11:1 Format + :5 Tomo ready switch related X11:3 ––> Bucky – Tomo remote switchover RGDVs*						

1) = has to be adjustet on site

[ ] = TDC